Global temperature for 2022 to be the 6th highest since 1891
(Preliminary)

The annual anomaly of the global average surface temperature for the year 2022 (i.e., the combined average of the near-surface air temperature over land and the sea surface temperature) is estimated at +0.24°C* above the 1991 – 2020 average, likely to be the 6th warmest on record. The past nine years (2014 to 2022) are likely to be the nine warmest years for the 132-year period since 1891 (Figure 1).

The monthly average air temperatures for June and October in 2022 were ranked the third warmest for each month. The seasonal average air temperature for the boreal summer (June to August) was also the third highest recorded since 1891 for the season.

On a longer time scale, the annual global average surface temperature has been rising at a rate of about 0.74°C per century, which is thought to be attributed to global warming due to increase in anthropogenic greenhouse gas concentrations including carbon dioxide. In addition the global averaged surface temperature is affected by inter-annual to decadal natural fluctuations intrinsic to the earth's climate. Positive temperature anomalies in mid- and high-latitudes in the Norhtern Hemisphere contribute greatly to raising the global average temperature. It is also known that the global mean surface temperature tends to decrease after a La Niña event occurs and vice versa. For this year, the La Niña trend has continued since the boreal summer of 2020. It is difficult to quantify how much the lingering La Niña trend has contributed to the rise in the average temperature in this year.

Warm temperature deviations are especially seen over wide areas of Europe to East Asia, and and most of the northern hemisphere (Figure 2).

The final report on the global temperature for 2022 is scheduled to be published early in February 2023.

* Note that this figure (hence its rank in the record, either) is still subject to change, because at the moment of this announcement it is only a preliminary result that was calculated based on temperature observations for the period of January to November in 2022.
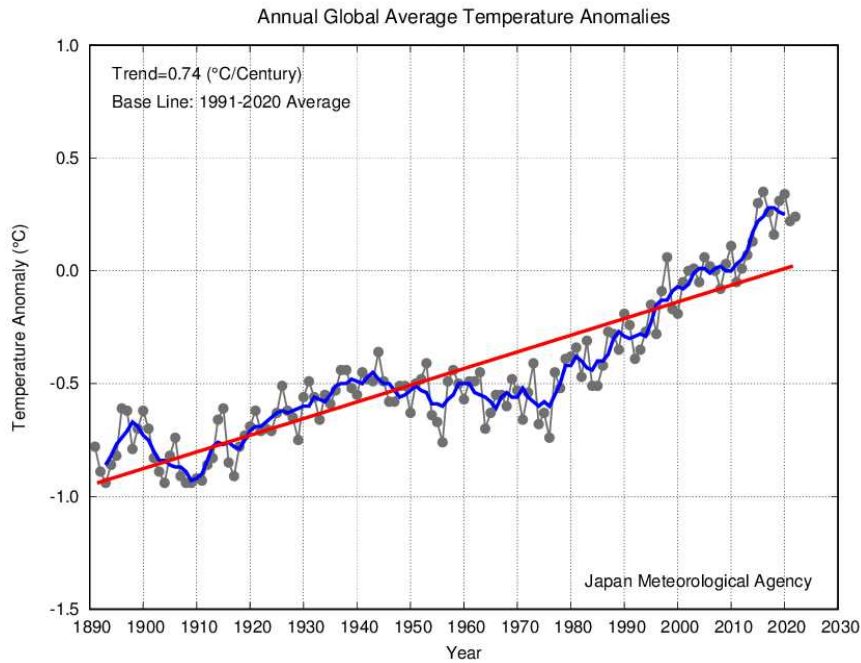
Figure 1 Long-term change in annual mean surface temperature anomalies over the globe (Preliminary value)

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Anomalies are derived from the 1991 – 2020 average baseline. The thin black line indicates surface temperature anomalies for each year, while the blue and red lines indicate the related five-year running mean and the long-term linear trend, respectively.
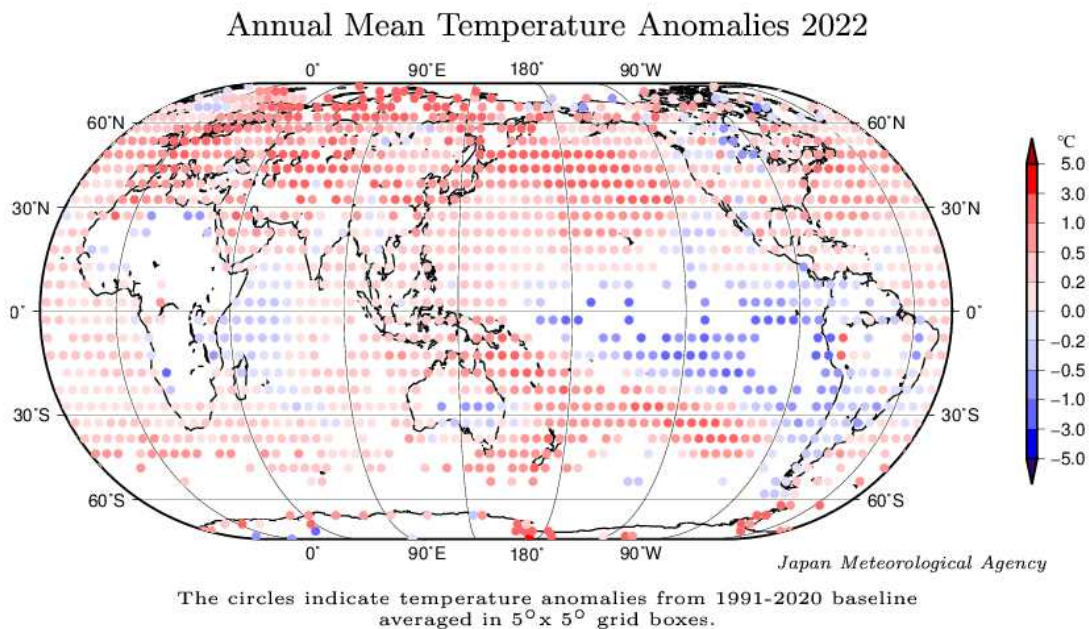

Figure 2 Annual mean temperature anomalies in 2022 (Preliminary value)

The circles indicate anomalies of surface temperature averaged in 5° x 5° grid boxes. The annual mean global temperature anomaly is determined by averaging the anomalies, derived from the 1991 – 2020 average baseline, of all grid boxes weighted with the grid box area.

Ranking of annual global average temperatures

Rank	Year	Temperature Anomaly w.r.t. 1991 – 2020 average
1	2016	+0.35
2	2020	+0.34
3	2019	+0.31
4	2015	+0.30
5	2017	+0.26
6	2022	+0.24*
7	2021	+0.22
8	2018	+0.16
9	2014	+0.13
10	2010	+0.11

＊2022 is preliminariy value